Motor Choices for Schionning Designs

By Jeff Schionning

Diesels

The designers preference is for shaft drives where using diesels, these are lighter and sit further forward centralising weight better and allowing a more natural trim throughout. They keep the draft shallower and when used with a twin blade folding propeller allow ropes and debris to slide past without causing damage or tangling.

Professional boat builders prefer sail drives as they are quicker and easier to install, which often is not the best option for the boat or the client. Some owners want the motors set far aft outside the accommodation area, wanting to keep noise and smells out of the cabins. This is a fair comment but well fitted motors with good sound-proofing and well sealed hatches will be just as good. Set further forward to help centralise weight and keeping the hull ends lighter and the pitching moments down. These safety considerations are far more important than the few times you will actually motor.

This is an important consideration because Schionning designs are very efficient sailing well in light conditions, meaning the motors are used far less than most other designs. We have raced at Langkawi before cruising back to Phuket over a few weeks on one of our Waterline 1480 designs, and this area has very light wind conditions. Despite being in company with fairly fast boats we sailed 95% of the time while the others motored 90% of the time. It is important to put this in perspective and realise the motors are not run that often, can be smaller because of the very low drag values and do not need huge fuel storage.

Diesel Engine Size Guide:

- 9 - 11 metre design **15 to 20 HP**
- 11 - 15 metre design **20 to 40HP**
- 17 - 18 metre design **40 to 75HP**

The Waterline 1480 used two 37HP motors and the owners found them very good, commenting that in rough conditions they slowed a bit as they were getting airborne and they felt they could have been smaller.

Our new G-Force 1800 design ('KATO') has two 75HP sail drives and motors at 15 knots with ease. The owner is very happy with the choice, these are set well forward under the aft double bunks with no smell or fumes.

These may seem rather high horsepower engines but they are based on the Yanmar 50HP motor and when the turbo is added they are rated at 75 HP with very little weight difference.

Outboards

Many of our designs use a twin or single outboard motor configuration and they have proven to work extremely well giving a far cheaper, lighter option that is easy to repair or replace. These are set in wells aft using a parallel box to control load and a plate on the skeg bottom to seal the cavity when the motors are pulled up and you're sailing. The up-haul is simply a rope purchase run to the cockpit, you simply pull until fully raised then cleat and simply release to drop down for motoring. The 4-strokes are very quiet, economical and smooth running.

Charging ability is lower than diesels, and there is no option to heat water from the exhaust. In general we only recommend them on designs up to 12 metres, the main reason being motor availability - the Yamaha 9.9hp has a low geared gearbox and big propeller. It also reverses the exhaust gas when in reverse making it an ideal unit for multihulls, unfortunately there are not many bigger motor options with these positives. Saying that we do have a few bigger 1480 designs very happy with their twin 30HP Honda outboards.

There are times you wish you had a little more power but this is common with most motors you need to consider the costs of having more solar panels and possibly a wind generator to increase your charging ability. Carrying petrol is not an issue and the motor areas are pressure fed with blowers for adequate air flow and to avoid overheating. The blowers are set in the cockpit seats with air ducted into the motor wells, the blowers are run for a few minutes before starting to get rid of any possible fumes and then run after use to avoid hot damp air causing accelerated corrosion. This option works very well.

Single outboard motors set in a mid-nacelle are used mostly on the smaller designs, we place the motor further forward where it sits on the pivot point when motoring into waves and have found there is very little cavitation or airation. Many owners are nervous of one motor feeling the manoeuvrability will suffer but once you get used to keeping the speed up and the daggerboards down it is very easy.

The Arrow 1200 design uses the single motor in the mid position and I feel this is an ideal set-up, firstly we are using the tube system developed on our “Spudgun” design, this uses an alloy tube as the motor bracket - on the forward end it has a 'T'-type shaft welded to the tube, while on the aft end it has a small transom bracket to hold the motor. The tube is hinged forward under the mast bulkhead with the motor positioned under the cockpit/saloon bulkhead so that when raised it fits neatly into a cavity made from a step/seat in the cockpit and part of the galley locker in the saloon. The tube lifts to be flush under the BD keeping the motor well clear of the water and well protected.

The tube is the fuel tank solving the problem of where to site the tank and when it is lowered it simply hangs on two wire stays, setting the leg depth in the water. A soft canvas spray deflector keeps the motor dry through waves, a very neat and clever system.

In this case we will use a bigger motor as we want good motoring speed and power, small choice the Honda 30HP bigger can be the E-Tech 50 perhaps, speed should be about 15 knots. For the bigger cats I would consider an electric bow thrusters to give perfect manoeuvrability in tight spaces. Light, fast, cheap, perfect balance and trim, plus it opens up the aft cabins with no motors to consider in your build. Hard to beat.

Electric Motor Options

There is a lot of discussion on this option and with technology getting better all the time and lithium batteries becoming a real option - it is an interesting topic. Many are looking at it as the “green” option but few of us are patient enough to embrace that fully, as that means using your power wisely. The recharge choices are to simply wait for the solar panels to give you enough power to move - this depends where you are - if it involves a long motor out of confined areas where sailing not an ideal option you will need full batteries. However if you simply need to get out into open water and can sail then that would be a quicker option. The DC motors charge under sail if the propellers turn the motors, this needs solving as for low drag - we want folding props but to charge need a fixed prop and the ability to lift the fixed prop out of the water once charging is complete. The options are to use a feathering prop that remains open with charging pressure but folds with more pressure (put motor astern) or mount the DC motors in place of the outboard power head and use the trusted pull up option.

A full DC choice will use two DC motors of about 7 - 20KW and to achieve any reasonable cruising range will require a large lithium battery bank of about 1000 - 2000 12V amp hours, most DC motors use 48 volts.

The DC option limits speed somewhat being more in line with smaller diesel power as bigger DC motors then need a large Genset and the result is heavy and very expensive.

To me it would seem ones aim is to balance the best technology available to give the simplest cheapest fastest result.

A full DC option will need a bit of backup for our faster lifestyle and simply adding a small 48V diesel Genset would give more independence, the balance is important, we simply want to extend our motoring range to an average of normal usage. Mostly you will motor out of the marina or from an anchorage seldom using more than half throttle, get into clear water then raise the sails and head off, if there was no wind you may motor for an hour or two until the wind kicks in. If you were intending to motor a longer distance you would run the genset from the get go to extend your 5 hours of motoring ability to perhaps 8 - 12 hours, you would be using up your battery power even with the Genset

running. One would feel OK with this balance and not go overboard with a huge Genset able to run both motors at almost full power. (A moderate genset could allow motoring indefinitely at perhaps 35% power). If you start adding big diesel power then why bother with DC motors at all?

Looking at a hybrid, sort of, and reducing the number of motors to a minimum to me seems a good solution, using one slightly bigger diesel in one hull driving a conventional shaft and prop plus driving a 48V DC generator solves one motor and genset in one then use a smaller DC motor in the other hull solves all our power issues.

We have good motoring speed in open water with the bigger diesel a high output generator charging enough power to fully power the small DC motor used for manoeuvrability in tight spaces plus a wind/sailing generator from the small DC motor when sailing.

Lithium batteries are a no brainer now, costs are close to normal glass mat type and the weight is about a quarter, size about half. They can be drained to only 15% remaining without damage, recharge to 100% fast and last a long time. Where we had a house bank of lead acid batteries of on average 400AH we could only safely use 50%, so you are really only living with 200AH of power. We can now have more usable power from a house bank of 300AH of lithium but if we are using a DC motor it would be sensible to use 4x12v x 100AH batteries to give a 400AH bank.

We find a simple rule of thumb with our designs is to have about half the battery bank AH's in Watts of solar panels. Eg: 400AH of batteries then use 200-250W of panels this gives a good balance between usage and recovery time.

Motor Choice Considerations

1. Diesels are more expensive and more work to install but do offer better charging and water heating and economical and preferred by less experienced buyers. A good choice for designs above 12 metres.

2. Negatives are weight, cost, diesel and exhaust smell and props or legs open to damage with debris and beaching.

3. Outboards are very good, cheaper, quiet and economical and once you get used to the no drag character they offer its hard to tolerate dragging props around, negatives are lower charging and the impact they have on resale with less experienced buyers.

4. DC electric options, there are some very good systems from professional suppliers like Ocean Volt - these are rather expensive. Other DC motors available on the net are surprisingly inexpensive but one needs to find a solution for charging and power control. This management system on the few cats I have experienced was the problem but most were trying very automatic solutions where I think simple would be better. There is a lot of interest in this solution but still not too many successful results and this will impact badly on resale values until the idea is more widely accepted.

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